

Effect of Cost Reduction on MECO (WBS 1.4.4)

2/9/05 – W. Meng

(1) 1.4.4.2.1. Equipment Removal ---

Cost reduction \$327k was done to use DOE/HEP program fund to remove existing components in A line and D line. There will be no impact on the physics of the MECO. There could be schedule impact, if this fund does not arrive when it is needed.

(2) 1.4.4.2.2.7 Cosmic ray shield on detector solenoid ---

Cost reduction \$490k was done to use existing heavy concrete inventory. It might increase the background of cosmic ray veto counters during the data acquisitions. Based upon the present measurements and discussions, it seems fine. (Backup material: email from John Kane to Dave Phillips.)

(3) 1.4.4.2.3.2 Power Supply Controls to PSI --

Cost reduction \$374k was done to use existing control hardware DataCon cards. It may affect the reliability of the power supply control system for beam line magnets; increase some “down time” during the operation.

(4) 1.4.4.2.3.4 Magnet Monitor –

Cost reduction \$41k was done to use existing “green box” (instead of new PLC option). It may increase the trouble-shooting time when a magnet fails.

(5) 1.4.4.2.5.1 Beam Line Vacuum –

Cost reduction \$43k was done to use existing vacuum pumps in A line. It might affect slightly on the beam line vacuum reliability due to some aging parts.

(6) 1.4.4.3.1.2 Current Transformers

Cost reduction of \$22k was done to eliminate the purchase of the signal processing electronics for the second current transformer. This will result in the inability to measure extinction quality in the transport beam line.

(7) 1.4.4.3.1.3 Beam Position Monitors –

Cost reduction \$138k was done to eliminate beam position monitors, but keep External Beam Profile Monitors (EPM's) in 1.4.4.3.1.1 (SWIC's should be understood as EPM's). Elimination of beam position monitors will result in the loss of a separate non-destructive measurement technique to determine the averaged (center of mass) beam position of the bunched beam. Advantages of BPM's over EPM's are: simpler beamline device, no dependence on transport vacuum, faster and possibly more accurate measurement. Disadvantages include: BPM's only provide center of mass position (no profile), and signal conditioning electronics needs to be designed & built.

(8) 1.4.4.3.1.4 Loss Monitors

Cost reduction of \$14.4k was done to change the type of detector used in the transport. Using a less expensive short heliax cable based detector instead of RHIC or SNS style ion chambers will result in loss measurements with less sensitivity, speed & dynamic range than the alternative style. The heliax-based detector has been successfully used previously as a high intensity proton transport loss monitor.

(9) 1.4.4.5 Controls –

Cost reduction \$81k was due to (3). There is no direct impact on MECO physics and schedule.

(10) 1.4.4.6.3.3 New Counting House –

Cost reduction \$312k was done to eliminate a new counting house, which was originally requested by MECO collaboration. There will be no impact on MECO physics and schedule. The previous E871 counting house will be modified to meet all requests.